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An Eye on the Safeness of Defrosted Seafood – Shrimps and Escolar

Dani Dordevic and Hana Buchtova

Faculty of Veterinary Hygiene and Ecology, Department of Meat Hygiene and Technology, University of Veterinary and Pharmaceutical Sciences, Palackeho tr. 1946/1, 612 42 Brno, Czech Republic

Corresponding author: Dani Dordevic

dani_dordevic@yahoo.com

Faculty of Veterinary Hygiene and Ecology, Department of Meat Hygiene and Technology, University of Veterinary and Pharmaceutical Sciences, Palackeho tr. 1946/1, 612 42 Brno, Czech Republic.

Tel: +420 541 561 111

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Abstract

Seafood consumption is in constant increase since 1960s. Though, there is diversity in seafood consumption worldwide (per capita/per year). The increase tendency of seafood consumption in the Europe can be predicted by the fact that average seafood intake among European population is around 7 kg/per year, while recommended amount is 14.5 kg.

Keywords: Seafood; Tropomyosin; *Lepidocybium flavobrunneum*

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Introduction

There is a connection between more educated/richer societies and more health consciousness among the population. At the same time health consciousness is connected with seafood consumption mainly due to beneficial omega-3 fatty acids content, highly digestible seafood proteins which encounter all essential amino acids, vitamins and mineral contents [1-3].

Following factors should be underlined: seafood business is one of the most profitable investments; seafood trading is growing too; seafood business needs new markets; continental countries represent a target group for seafood trade spreading. This movement of seafood in continental countries represents for producers and trader logistical problem, since seafood is highly perishable and at the same time pricy commodity. Freezing is then the only solution for supplying continental countries and satisfying seafood demand in the countries such as the Czech Republic [4,5].

Such commodities which are mainly imported to the Czech Republic in frozen condition are shrimps and escolar seafood. These seafood commodities in the Czech Republic are sold very often as thawed/defrosted products. The lacking of legislation which would consider the shelf life of thawed/defrosted seafood gives sellers or producers the chance to label or estimate the shelf life of defrosted seafood alone without accordance with researches [6-8].

Factors Influencing their Shelf Life

Shrimps are acceptable for consumers due to their sensory properties, low fat content and high protein content [9]. Manipulation after capturing/harvesting of seafood is very important for shelf life, especially with seafood species such as shrimps which have neutral pH, high water activity and larger amount of nitrogen compounds that do not belong to proteins [10-12]. Shrimp species contain tropomyosin, an allergen which can cause problems for people sensitive to it.

Shelf life is an important factor in the seafood business and it can be increased by holding shrimp's species on the temperature of melting ice, under +2°C. Low temperature under +2°C and the stability of temperature are the most important factors influencing shrimp species shelf life. Though, other factors can also influence their shelf life (manipulation after catching/harvesting, modified atmosphere packaging, salt content), but the temperature regime showed the greatest influence [13-15].

Discussion

Attention to shelf life after defrosting should be also pointed to the species which already represent a certain hazard for consumers due to their nutritional/chemical composition. Escolar species (*Lepidocybium flavobrunneum* and *Ruvettus pretiousus*) can represent, beside known hazardous nature (wax esters of fatty acids, parvalbumin presence), additional risk for consumers

when they are frozen and sold as a defrosted product over a certain storage period. Escolar species used to be a by-product of fishery, but it has started to be consumed worldwide due to sensory characteristics. Though, sensory characteristics are not the only reason for escolar species consumption, another reason can be over exploitation of seafood sources and peoples' curiosity toward new meals plays a role too. Escolar species contain wax esters which can cause gastrointestinal problems, since they are not digestible by humans and animals. The proposed maximum daily intake limit is 170 g of escolar species, but EFSA in its study also stated that exact boarder intake limit cannot be clearly estimated due to differences in sensibility among humans [16-19].

The studies showed the excessive formation of thrimethylamine (TMA) and increase level of fat hydrolysis in defrosted *L. flavobrunneum* after 7 days of storage (vacuum and vacuum skin packaging at +2 ± 2°C). Another bigger problem in escolar species is histamine and other biogenic amines formation in defrosted/thawed fillets. Though, histamine formation in defrosted fillets can be at a slower rate than in fresh stored in refrigerator. The problem is that after 7 to 9 days of chilled storage +2 ± 2°C histamine content can achieve levels exceeding Regulation limits [18] and represent a serious hazard for consumers' health [6,8].

Conclusion

Shelf life of defrosted seafood species is a complex issue that should be overviewed for each species separately concerning their chemical, nutritional and other specifics. For sure that manipulation with seafood after catching/harvesting is the main prerequisite for seafood safeness, but all steps after catching should be done in the way to provide the best quality and eliminate hazards during all time of storage. Interaction between certain chemicals formed in seafood species during the storage period with further processing or culinary preparation should be studied more because there are evidences that these kinds of interactions can affect safeness of final meal. Lower temperature, under +2°C is the main brake for stopping seafood quality/safeness decrease, but certainly that other technologies such as modified atmospheres and different packaging options are welcome to improve shelf life of defrosted seafood and provide more diverse seafood species portfolio to broader world population.

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